

Outline of Supersymmetry Talks (tentative)

Hye-Sung Lee

- **Talk 1. Why SUSY(Supersymmetry)? What is SUSY?**

- Gauge hierarchy problem (desire of new symmetry)
- Poincare symmetry (spacetime symmetry of QFT)
- Extended Poincare symmetry (SUSY)
- Properties of SUSY multiplets

- **Talk 2. Construction of SUSYic Lagrangian**

- Chiral and vector superfield
- Gauge interaction
- Soft breaking of SUSY

- **Talk 3. Construction of MSSM(Minimal SUSYic Standard Model)**

- R -parity
- Superpotential and soft breaking terms of MSSM
- Electroweak symmetry breaking
- Superparticle mixing and Feynman rules

- **Talk 4. Beyond MSSM**

- Weakness of MSSM (including μ -problem)
- $U(1)'$ -extended MSSM
- TeV-scale Z' gauge boson
- Implications of $U(1)'$ -extended MSSM

References

- Textbooks:
 - *Collider Physics*, V. Barger and R. Phillips (Chapter 14)
 - *Supersymmetric Gauge Field Theory and String Theory*, D. Bailin and A. Love
 - *Supersymmetry and Supergravity*, J. Wess and J. Bagger
- Reviews:
 - *Introductory Low-Energy Supersymmetry*, H. Haber [hep-ph/9306207]
 - *An Introduction to Supersymmetry*, M. Drees [hep-ph/9611409]
 - *A Supersymmetry Primer*, S. Martin [hep-ph/9709356]
 - *Lectures on Phenomenology*, G. Weiglein (ICTP Summer School 2003 lecture note)
 - *Introduction of Supersymmetry*, H. Haber (TASI 2004 lecture note)
- Huge selections at <http://www.slac.stanford.edu/spires/> (Sep. 2004)
 - SUPERSYMMETRY in title: 5093 papers or reviews
 - INTRODUCTION + SUPERSYMMETRY in title: 47 papers or reviews
- My own transparencies in this talks at
 - <http://pheno.physics.wisc.edu/~comety/PH835/>
- For references of the $U(1)'$ -extended MSSM, see *The Z' Hunter's Guide* at
 - <http://pheno.physics.wisc.edu/~comety/hunter/>